

Barrick Goldstrike Mines Inc.

P.O. Box 29
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CLASS I (TITLE V) AIR QUALITY OPERATING PERMIT - MINOR REVISION
AIR CASE 07AP0323

Permit AP1041-0739.01



BY

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DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR POLLUTION CONTROL

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1.0 INTRODUCTION

Barrick Goldstrike Mines Inc. (Barrick) submitted a Class I minor modification application on March 22, 2007, for a minor revision to their existing Class I (Title V) air quality operating permit. The Nevada Division of Environmental Protection - Bureau of Air Pollution Control (BAPC) declared Barrick's permit minor revision application administratively complete on April 5, 2007. Pursuant to NAC 445B.3425(3)(b), a copy of the Minor Revision application was sent to the Environmental Protection Agency on April 24, 2007. In this minor modification, Barrick proposes to increase the hourly and annual throughput rates of system 95 and remove several sources from System 95. In addition, Barrick proposes to remove Systems 99D and 99E and add controls to Systems 99C and 99F. Barrick also proposes to add a new fuel oil storage tank, add a new boiler, and add the option of using an enclosure or pneumatic sprays on system 12.

Originally, Barrick had proposed to modify the Boiler #4 catalyst activity testing frequency. This proposal has since been removed from the application per e-mail sent March 23, 2007.

The BAPC case log number for this application is 07AP0323. The facility consists of an open pit mine, two underground mines, and process facilities. Support facilities located on site but not owned by Barrick include the Air Liquide oxygen plant permitted under operating permit AP2813-0133.01.

Barrick's Goldstrike mine is located in the Lynn Mining District northeast Nevada, 27 miles north of Carlin, at the southern end of Elko County and the northern end of Eureka County. The facility operations are located approximately at the intersection of the Carlin Trend (northwest-southeast strike) and the Shoshone Belt (southwest-northeast strike). The principal operation is metal mining and the processing of gold ores.

1.1 PROCESS FLOW DIAGRAM

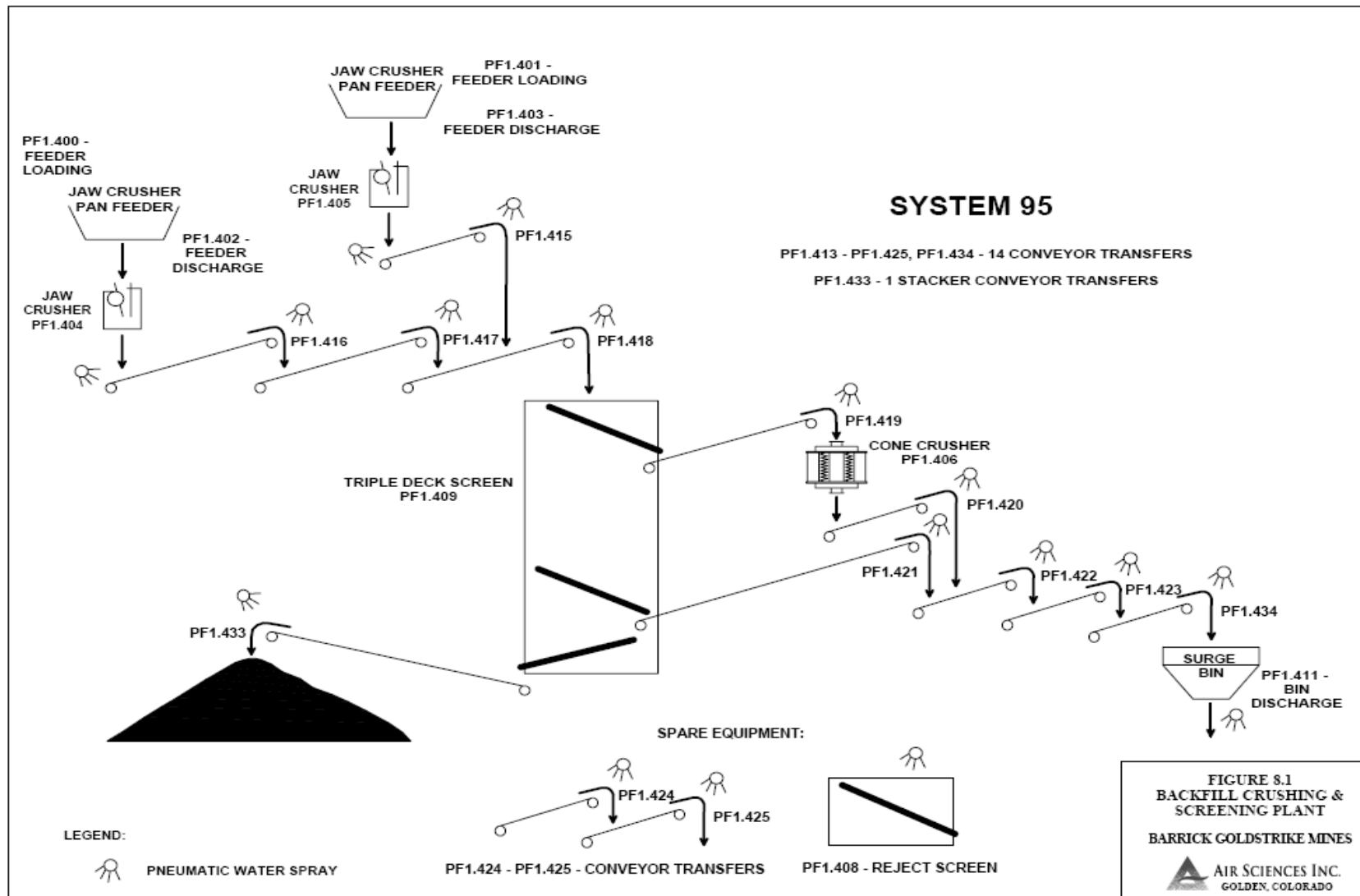
Barrick has proposed several modifications under this application. The changes are summarized below.

Project 1: Barrick Goldstrike Mines Inc. (Goldstrike) proposes to revise the control on the System 12 coarse ore stacking conveyor to be pneumatic sprays or an enclosure. Emissions for the coarse ore stacking conveyor were calculated as a worse-case scenario with an enclosure as the applied control.

Project 2: Goldstrike proposes to increase the maximum throughput for all System 95 sources from 700 tons per hour to 1,000 tons per hour and from 1,800,000 tons per year to 3,000,000 tons per year. This modification will allow for additional flexibility for satisfying backfill material production needs. In addition, Goldstrike would like to remove System 95 sources which are not in use. The sources include:

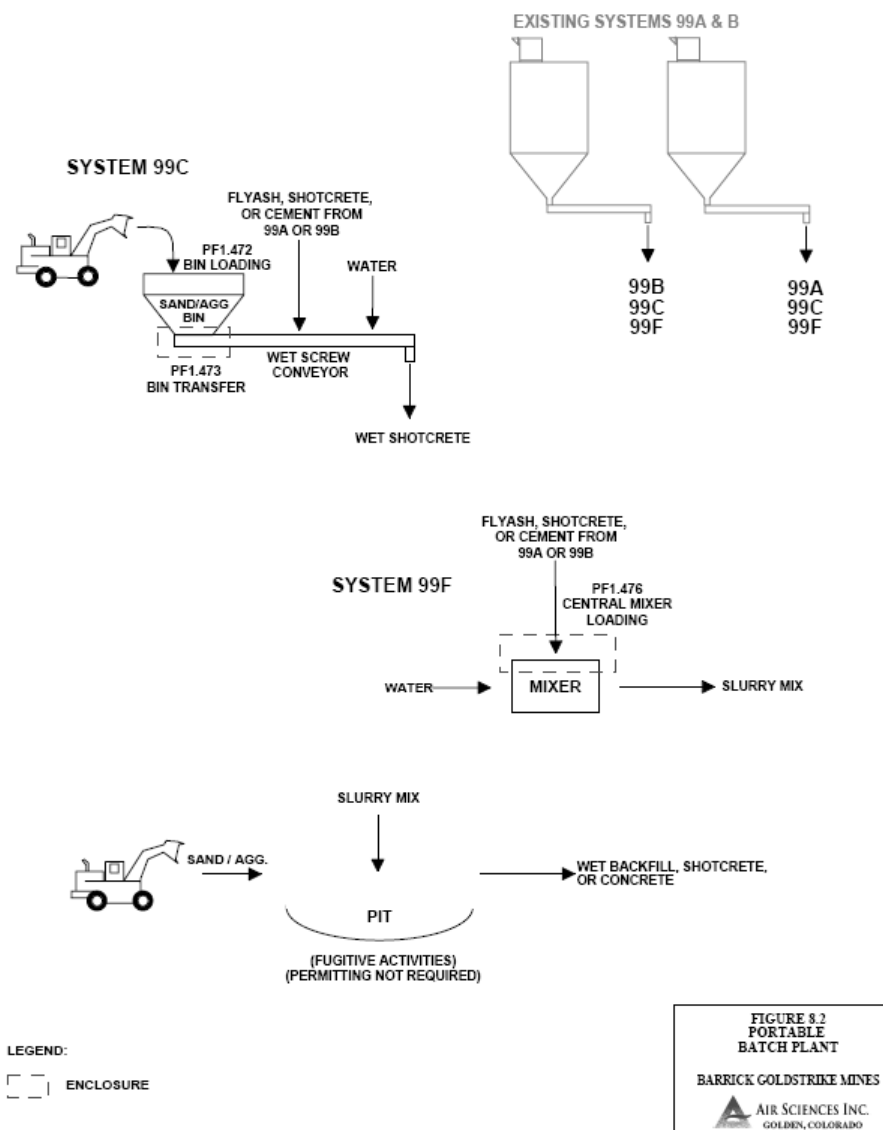
- PF1.407 – cone crusher 2 and transfer belt
- PF1.410 – B half of twin screen and transfer belts
- PF1.412 – twin screen feed conveyor transfer
- PF1.413 – conveyor transfer
- PF1.414 – conveyor transfer
- PF1.426 – conveyor transfer
- PF1.427 – conveyor transfer
- PF1.428 – conveyor transfer
- PF1.429 – conveyor transfer
- PF1.430 – conveyor transfer
- PF1.431 – conveyor transfer
- PF1.432 – conveyor transfer
- PF1.435 – stacker conveyor transfer
- PF1.436 – stacker conveyor transfer

A process flow diagram of System 95 is provided below.



1.1 PROCESS FLOW DIAGRAM (continued)

Project 3: Systems 99C through 99F of the portable batch plant were permitted on July 13, 2006. These sources have not been constructed, and since their permitting, a simpler portable batch plant design has been developed. Goldstrike proposes to modify the permit to reflect the simpler design. In doing so, Goldstrike would like to remove Systems 99D (sand bin) and 99E (weigh hopper) from the permit and add controls to Systems 99C (aggregate bin) and 99F (central mixer). Goldstrike proposes to revise System 99C to allow either sand or aggregate as the processed material. Goldstrike is also removing source PF1.471 (aggregate conveyor discharge) from the permit. Aggregate transfer emission factors were used to calculate worse-case emissions from the revised System 99C. A flow diagram showing the new controls for Systems 99C and 99F is provided below.



1.1 PROCESS FLOW DIAGRAM (continued)

Project 4: Goldstrike proposes to add one 250,000 gallon diesel fuel storage tank to the AA fuel bay.

Project 5: Goldstrike proposes to add one 13.2 MMBtu/hr boiler. The new boiler will be used to supply heat to the existing strip circuit.

Throughout this application, updated AP-42 emission factors were used to calculate emissions from revised Systems 95, 99C, and 99F.

2.0 APPLICABLE REQUIREMENTS

Applicable requirements are those regulatory requirements that apply to a stationary source or to emissions units contained within the stationary source. In Nevada's program, the regulations governing the emissions of air pollutants from which the applicable requirements originate are derived from four categories of regulations. These four categories consist of the requirements contained in the Nevada Revised Statutes (NRS), the Nevada Administrative Code (NAC), the Applicable State Implementation Plan (ASIP), and the Code of Federal Regulations (CFR, contained in various Parts within Title 40).

Barrick has chosen to conduct a streamline analysis for many of the applicable requirements under the NAC and SIP. A streamline analysis is conducted by the applicant and demonstrates that the permitted limits will comply with the various allowable limits set by the NAC and SIP. A streamline analysis for the proposed systems was conducted in Barrick's minor modification application. A copy of the streamline analysis for the proposed systems may be seen in Barrick's minor modification application.

2.1 GENERALLY APPLICABLE REQUIREMENTS

Of the four categories of regulations governing emissions of air pollutants, there are many generally applicable requirements that apply to stationary sources and emission units located at a stationary source. A comprehensive summary of applicable permit requirements is contained in Sections I through V of the Title V air quality operating permit.

2.2 SPECIFIC APPLICABLE REQUIREMENTS

Nevada Revised Statutes

The Nevada Revised Statutes (NRS) is the statutory authority for the adoption and implementation of administrative regulations. The statutes relating to the control of air pollution are contained in NRS 445B.100 through 445B.640. The NRS specifies that the State Environmental Commission is the governing body given the power to adopt administrative regulations. Because the NRS is the enabling statutory authority, very few specific requirements are contained in the statutes. Rather, the NRS provides, generally, broad authority for the adoption and implementation of air pollution control regulations.

2.0 APPLICABLE REQUIREMENTS (continued)

Nevada Administrative Code

The Nevada Administrative Code, (NAC), is a collection of administrative regulations that contain specific requirements relating to the control of air pollution. The State Environmental Commission adopts these regulations. The NAC requires that, where state regulations are more stringent in comparison to Federal regulations, the State regulations are applicable. The NAC sets forth, by rule, maximum emission standards for visible emissions (opacity), PM₁₀ and sulfur emitting processes. Other requirements are established for incinerators, storage tanks, odors and maximum concentrations of regulated air pollutants in the ambient air. Other NAC regulations specify the requirements for applying for and method of processing applications for operating permits. All of the equipment considered in this application must meet, at a minimum, the applicable standards and requirements set forth in the NAC. Specifically, the emission standards contained in NAC 445B.2203 for particulate matter, 445B.22047 for sulfur emissions, 445B.22017 for opacity, and 445B.22097 for the ambient air quality standards must not be exceeded.

Nevada Applicable State Implementation Plan (ASIP)

Nevada's most recent ASIP, which was approved by U.S. EPA, is based on State regulations codified in 1982 and amended from time to time and the latest SIP update is currently under EPA review. In general, the regulations contained in the ASIP closely parallel the current NAC regulations. However, because the ASIP is based on older air quality regulations (at this time), compliance with all the current NAC regulatory requirements does not necessarily ensure compliance with the ASIP requirements. All the equipment considered in this application must meet, at a minimum, the standards set forth in the ASIP. Specifically, the emission standards contained in ASIP 445.731 for particulate matter, ASIP Article 8.2 for sulfur emissions, SIP 445.721 for opacity, and ASIP Article 12.1 for the ambient air quality standards must not be exceeded.

New Source Performance Standards (NSPS)

The U.S.EPA has promulgated maximum emission standards and monitoring / recordkeeping methods for selected source categories. These standards are contained in Title 40 of the CFR, Part 60, and are known as the New Source Performance Standards (NSPS). System 95 (Backfill Crushing and Screening Plant) and System 99C (Portable Batch Plant Sand/ Aggregate Bin) are subject to the requirements set forth under Subpart OOO - Standards of Performance for Nonmetallic Mineral Processing Plants (40 CFR Part 60.670). Under Subpart OOO, several emission units in System 95 and System 99C will be required to meet more stringent opacity limits. Crushers are required to comply with a 15 percent opacity limit under Subpart OOO. Screens and conveyors are required to comply with a 10 percent opacity limit under Subpart OOO. Systems 95 and 99C will also be subject to additional notification and recordkeeping requirements.

2.0 APPLICABLE REQUIREMENTS (continued)

40 C.F.R. Parts 61 and 63 National Emission Standards for Hazardous Air Pollutants (NESHAP)

Parts 61 and 63 establish the National Emission Standards for Hazardous Air Pollutants (NESHAPS). There are no sources at the facility for which a standard has been established under these parts.

40 C.F.R. Parts 72 to 78 Acid Rain Exemption

The Barrick facility is exempt from the acid rain provisions under 40 C.F.R. Parts 72 to 78 because there are no units listed in Tables 1, 2, or 3 of §73.10 at the facility, and there are no utility units at the facility that serve a generator that produces electricity for sale.

40 CFR Part 52.21. Prevention of Significant Deterioration Regulations (PSD)

The U.S. EPA delegated implementation of the federal PSD regulations to the State of Nevada; and BAPC implements the federal PSD regulations through a delegation agreement with EPA. These regulations contained at 40 CFR Part 52.21 specify federally required permitting procedures for each "major stationary source". The PSD regulations define a "stationary source" as "any building, structure, facility, or installation which emits or may emit any air pollutant subject to regulation under the Act." A "building structure facility or installation" is defined as "all of the pollutant emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control) except the activities of any vessel. Pollutant-emitting activities shall be considered as part of the same industrial grouping if they belong to the same "Major Group" (i.e., which have the same first two digit code) as described in the Standard Industrial Classification Manual, 1972, as amended by the 1977 Supplement."

"Major" is defined as the potential to emit of a stationary source, which equals or exceeds a specified threshold (in tons per year) of any air pollutant regulated under the Clean Air Act (40 CFR 52.21(b)(1)). The first threshold is for a stationary source that emits or has the potential to emit 100 tons per year or more and is defined as one of 28 specific categories of sources (see 40 CFR 52.21(b)(1)(i)(a)). The other applicability threshold is for any other stationary source that emits or has the potential to emit 250 tons per year (see 40 CFR 52.21(b)(1)(i)(b)). As mentioned above, the SIC code for this facility is 1041. None of the 28 specific categories is representative of this facility. Major stationary source status therefore is classified at the 250 tons per year emission threshold for any pollutant regulated under the Clean Air Act for the Barrick facility.

2.0 APPLICABLE REQUIREMENTS (continued)

As discussed above, 40 CFR Part 52.21 specifies that Prevention of Significant Deterioration (PSD) review is required for any new major stationary source or any major modification. A major source is defined as any pollutant emitting activities, which belong to the same two digit Source Industry Classification (SIC), and:

1. Emit 100 tons/yr or more of a regulated air contaminant as one of the listed categories of sources listed in 40 CFR 52.21; or
2. Emits 250 tons/yr or more of a regulated air contaminant and belong to any other category sources.

Although this facility is not classified as one of the listed categories of sources, the facility-wide potential to emit of several regulated pollutants exceed 250 tons/yr. The facility is a major stationary source for PSD purposes. Barrick has submitted emission calculations as part of the minor revision application, which indicates that the potential annual emissions from this minor revision will not equal or exceed specified significant thresholds (in tons per year) of any air pollutant regulated under the Clean Air Act (40 CFR 52.21(b)(1)). Specific emissions increases may be observed in the table presented below.

Figure 2: Emissions Increase vs. PSD Significant Thresholds

Pollutant	Emissions Increase (tons/year)	Significant Level (tons/year)
PM	-18.72	25
PM ₁₀	-8.76	15
NO _x	5.20	40
SO ₂	1.00	40
CO	5.20	100
VOC	0.32	40

The NDEP-BAPC reviews each proposed modification and evaluates whether each modification should be aggregated. In the letter dated March 20, 2007, Barrick explains that there have been five minor modifications to their Class I Air Quality Operating Permit No. AP1041-0739.01 in the last three years.

The first was a minor modification to the Carbon Kiln (System 61) submitted in February of 2004 and increased PM and PM10 emissions by 2.28 tons/year.

The second was a minor modification for an Indoor Air Dust Removal system (System 98) and increased PM and PM10 emissions by 8.45 tons/year.

2.0 APPLICABLE REQUIREMENTS (continued)

Following the modification to include System 98, Barrick proposed a minor modification for a portable batch plant that increased PM and PM₁₀ emissions by 20.99 and 9.17 tons/year, respectively.

In addition to the three modifications prior to this modification, Barrick also proposed on December 14, 2006 to modify their Title V permit to allow for the combustion of limited amounts of petroleum contaminated soil (PCS), carbon fines, and spent carbon from carbon adsorption controls in the roaster (Air Case #07AP0215), in addition to ore. The anticipated annual emissions increase for this modification is as follows: PM(0.20 ton/yr), PM₁₀(0.20 ton/yr), NO_x(1.24 tons/yr), SO₂(1.52 tons/yr), CO(1.59 tons/yr), VOC(0.74 ton/yr). This application was provided to EPA on April 2, 2007 for their 45-day review period. The 45-day review period will end on May 17, 2007.

Barrick currently is also proposing to modify their Title V permit to construct and operate an ore fines feed system to dry and feed ore fines to the roaster (Air Case #07AP0269). The processing of ore fines through this system will provide for a more efficient method of handling and processing fine ore inputs to the roaster than is possible with the existing ore handling system. The annual emissions increase for the additional modification are as follow: PM(11.6 tons/yr), PM₁₀(11.3 tons/yr), NO_x(8.32 tons/yr), SO₂(0.70 tons/yr), CO(4.20 tons/yr), VOC(0.40 ton/yr). This application was provided to EPA on April 2, 2007 for their 45-day review period. The 45-day review period will end on May 17, 2007.

The NDEP-BAPC agrees that these minor modifications are distinct and separate from the proposed minor modification and their emissions should not be aggregated towards the PSD significant thresholds.

Compliance Assurance Monitoring (CAM)

The U.S. EPA has promulgated requirements for sources to provide detailed monitoring plans that will ensure compliance with all applicable requirements. These monitoring requirements are contained in 40 CFR Part 64. Section 64.2 specifies that these monitoring requirements apply to a "pollutant specific emission unit at a major source" if all of the following are satisfied:

The unit is subject to an emission limitation or standard;

The unit uses a control device to achieve compliance with any such emission limitation or standard; and

The unit has potential pre-control device (uncontrolled) emissions equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source.

The key factors that would require the submission of a CAM plan are: 1) the facility must be defined as a "major source"; and 2) the units must be subject to an emission limitation or standard (acid rain limitations and standards are not included).

2.0 APPLICABLE REQUIREMENTS (continued)

Because Barrick Goldstrike is subject to the NSPS requirements and is a major source, a CAM plan would be required for all emission units with a potential pre-control device (uncontrolled) emissions equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source. No sources affected under this minor modification have a potential pre-control device (uncontrolled) emissions equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source, therefore a CAM plan is not required.

New Applicable Requirements

In accordance with NAC 445.B.295.2 (h)(2), Barrick must comply in a timely manner with any new applicable requirement that becomes effective during the term of the operating permit.

3.0 EMISSIONS INVENTORY

3.1 ANNUAL REGULATED EMISSIONS

Table 1. Summary of the Existing Facility's Potential to Emit (Tons Per Year)

Facility-Wide (Pre - Minor Revision)	H ₂ S	PM	PM ₁₀	NO _x	SO ₂	CO	VOC
	80.91	450.83	402.81	395.59	247.41	358.52	238.13

Table 2. Summary of the Minor Revision Increase (Tons Per Year)

MINOR REVISION INCREASE	H ₂ S	PM	PM ₁₀	NO _x	SO ₂	CO	VOC
	N/A	-18.72	-8.76	5.20	1.00	5.20	0.32

Table 3. Summary of the Potential to Emit (Tons Per Year)

Facility-Wide (Post - Minor Revision)	H ₂ S	PM	PM ₁₀	NO _x	SO ₂	CO	VOC
	80.91	432.11	394.05	400.79	248.41	363.72	238.45

A summary of the potential to emit emission inventory for this minor revision application was completed and is provided in Attachment 1.

3.2 HAZARDOUS AIR POLLUTANT (HAP) EMISSIONS INVENTORY

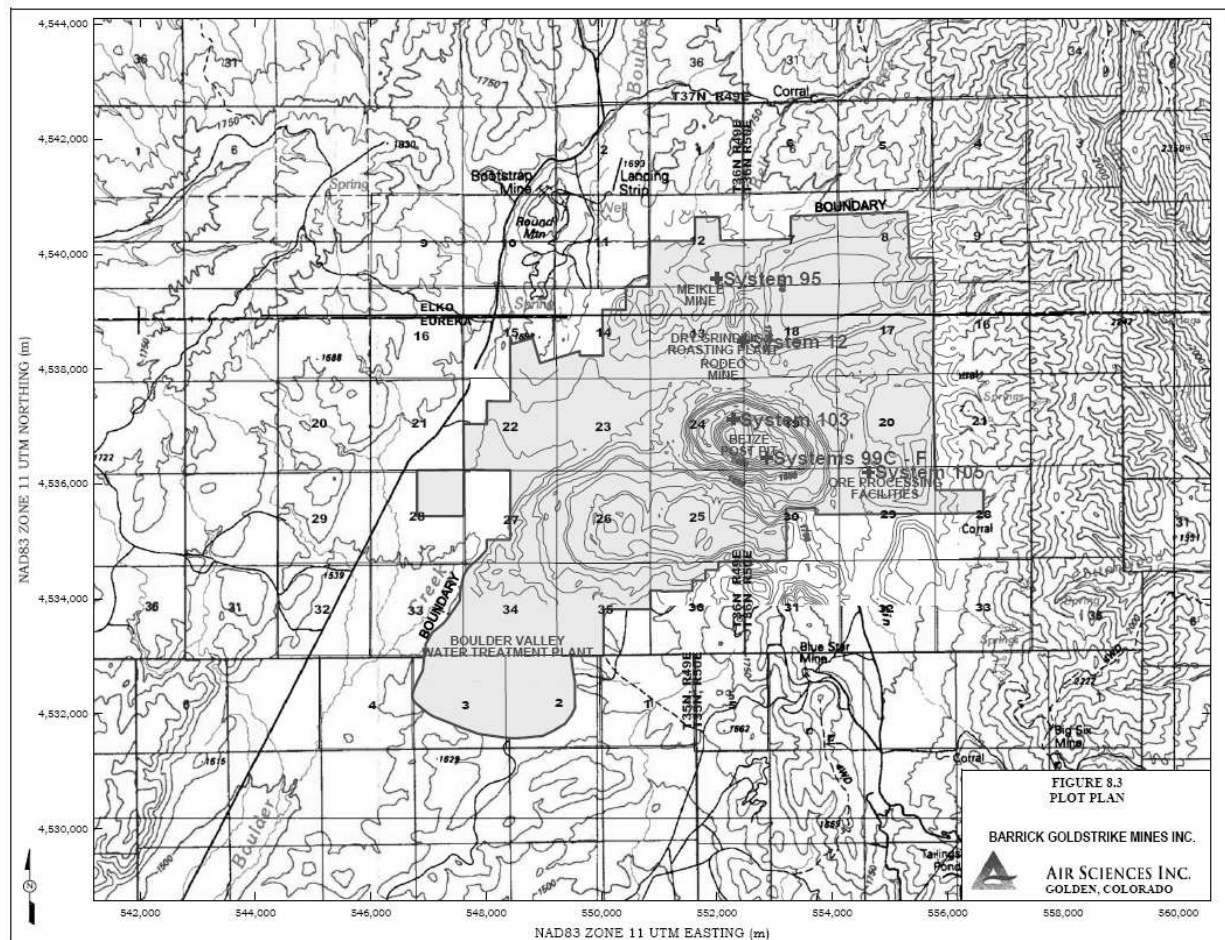
An historical reference indicates a major source review for HAPs was completed in December 1999, and updated Feb 2000, Engineering Review by NDEP, BAQ. According to the reference, the quantification was performed using the NDEP approved methodology, *Recommended Methodology for Quantification of Fugitive Dust Metals Emissions from Mining Activities for Title V Applicability*. The reference reports that the fugitive dust metal emissions add up to less than 10 tons per year per any single HAP, and 25 tons per year of any combination of HAPs. Specifically, the maximum for a single HAP is 3.80 tons per year of arsenic, 18.87 tons per year total for all HAPS.

4.0 AMBIENT AIR QUALITY IMPACT

The purpose of the ambient air quality analysis is to assess the ambient air impacts of criteria pollutant emissions for the facility, and to demonstrate that the emissions from the stationary source will not cause or contribute to a violation of any applicable federal or state ambient air quality standards. As part of the minor modification application, Barrick has provided an ambient air quality modeling analysis. The analysis was submitted by Air Sciences, Inc. on behalf of Barrick.

4.1 CLASSIFICATION OF AIR BASIN

The Barrick facility is located in the *Boulder Flat of the Humboldt River Basin*, Air Quality Hydrographic Basin Upper 61, Eureka County, Nevada. Basin 61U is currently classified as attainment for PM10 and unclassified for all remaining criteria pollutants that have an ambient air quality standard. The unclassifiable designation has been developed due to lack of monitoring data available to properly classify an air basin, such as Basin 61U.



4.0 AMBIENT AIR QUALITY IMPACT (continued)

4.2 METHOD OF AIR QUALITY MODELING ANALYSIS

The EPA approved AERMOD model was used to determine the 24-hour and annual PM₁₀ air quality impacts, NO_x annual air quality impacts, SO₂ 3-hour, 24-hour, and annual air quality impacts, CO 1-hour and 8-hour air quality impacts. AERMOD is a steady-state plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain. AERMOD was run for PM₁₀, NO_x, SO₂, and CO in order to demonstrate no exceedance of the ambient air quality standards for PM₁₀, NO_x, SO₂, and CO.

In order to determine the potential effects on ambient ozone concentrations a conservative screening methodology based on the “*VOC/NOX Point Source Screening Tables*” developed by Scheffe (EPA-OAQPS-TSD-SRAB, 1988) was implemented. The Scheffe model is used to identify estimated incremental ozone plumes that potentially exceed a threshold of 0.012 parts per million on an hourly basis. Two calculations are required to use the screening tables. The VOC/NOX ratio is calculated as the proposed annual VOC emissions divided by the proposed annual NOX emissions and is used with the X-axis NMOC/NOX tons per year values in the lookup tables. The annual VOC emissions are calculated as the maximum daily VOC emission rate multiplied by 365 for use with the Y-axis NMOC (tons per year) values in the lookup table. The Scheffe model was run in order to demonstrate no exceedance of the ambient air quality standards for ozone.

4.3 SOURCE INVENTORY

The modeling analyses are geared toward determining the impacts of the Barrick facility. As a result, the emissions inventory necessary for the modeling analyses was generated for all applicable emission units (Attachment 1).

Systems 90, 91, and 92 operate under a cap in the Title V Air Quality Operating Permit. The ten generators range from a heat input rate of 8.34 MMBtu/hr (Diesel Generator 1 - MP750) to a heat input rate of 19.68 MMBtu/hr (Diesel Generator 5 - MP608). As explained above, the generators operate under a cap, the NO_x cap is 40 tons/yr. In order to determine the modeled NO_x emission rate for each generator, a total heat input rate was calculated for all the generators (113.77 MMBtu/hr). Next the percentage heat input rate for each generator was determined (i.e. 17.30% for Generator 5). The percent heat input rate for each generator was multiplied by the 40 ton/yr cap, in order to find the specific emission rate for each generator (i.e. 6.92 tons/yr for Generator 5).

In addition the methodology utilized above, the Barric facility was also modeled assuming the largest boiler contributed 100% to the NO_x cap. The modeled ambient concentration under this methodology achieved an annual NO_x concentration of 7.11 µg/m³.

4.0 AMBIENT AIR QUALITY IMPACT (continued)

4.4 RESULTS

The ground level ambient air quality impacts from the emissions of criteria pollutants from all existing permitted sources and the sources proposed in this application are compared to the National and Nevada Air Ambient Quality Standards in the table below.

Background concentrations of PM₁₀, NO_x, and SO₂ were taken from data collected at the mine site. PM₁₀ background concentration is determined from the average of the PM₁₀ concentrations recorded from the last twelve months (02/01/2002 - 02/02/2003) of collected data at the mine site. During this period, two sampling points (04/14/2002 and 07/13/2002) were omitted from the average because they determined to be exceptional events. As recorded in the Quarterly Meteorological and Air Quality Data reports for Barrick Goldstrike on April 14, 2002, and July 14, 2002. According to the report, dust storms moved through the sampling area resulting in anomalous readings. With the exclusion of two sampling points, the remaining 58 points result in an average background PM₁₀ concentration of 28.3 µg/m³. NO_x and SO₂ background concentrations are determined from the average of the NO_x and SO₂ concentrations recorded from the twelve months (01/01/1995 - 12/31/1995) of data collected at the mine site.

The ozone background concentration was determined from the 2006 arithmetic mean of the one-hour ozone readings at the Great Basin National Park monitoring station (<http://www.epa.gov/aqspub1/monitor.html>)

Table 4.1 MODELING SUMMARY

NAAQS Primary Standard	Pollutant		Background Concentration	Point of Closest Public Access (w/background)
µg/m³			µg/m³	µg/m³
50.0 µg/m³	PM₁₀	Annual	28.3 µg/m³	35.8 µg/m³
150.0 µg/m³		24-hour	28.3 µg/m³	110.4 µg/m³
100.0 µg/m³	NO_x	Annual	19 µg/m³	25.8 µg/m³
1,300 µg/m³	SO₂	3-hour	3.0 µg/m³	68.2 µg/m³
365 µg/m³		24-hour	3.0 µg/m³	21.4 µg/m³
80 µg/m³		Annual	3.0 µg/m³	5.5 µg/m³
40,000 µg/m³	CO	1-hour	N/A	1,169.8 µg/m³
10,000 µg/m³		8-hour	N/A	482.7 µg/m³
235 µg/m³	Ozone	Annual	104.2 µg/m³	138.6 µg/m³

Given the information provided by Barrick in the Class I minor modification application, the NDEP-BAPC determined that this minor modification will not result in a significant change in air quality at any location where the public is present on a regular basis. This determination is based on the fact that the minor modification will only result in a insignificant increase in annual emissions. Also based on the location of the Barrick Goldstrike Mine, the presence of the public on a regular basis is very remote. Because this modification will not result in a significant change in the air quality, pursuant to NAC 445B.3395(8)(c) the provisions of NAC 445B.3395(6) and NAC 445B.3395(7), public notice provisions, do not apply.

Based on the above review and supporting data and analyses, Barrick's request for a minor revision to the Class I operating permit for the Barrick Goldstrike Mine will not violate any applicable requirements. As a result, it is recommended that Barrick's request for a minor revision to their Class I operating permit be approved.

Francisco Vega
Staff Engineer, Permitting Branch

Date

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Attachment 1

Minor Revision Emissions Inventory

Attachment 2

Ambient Impact Analysis

Attachment 3

Proposed Revised Operating Permit (revised pages)